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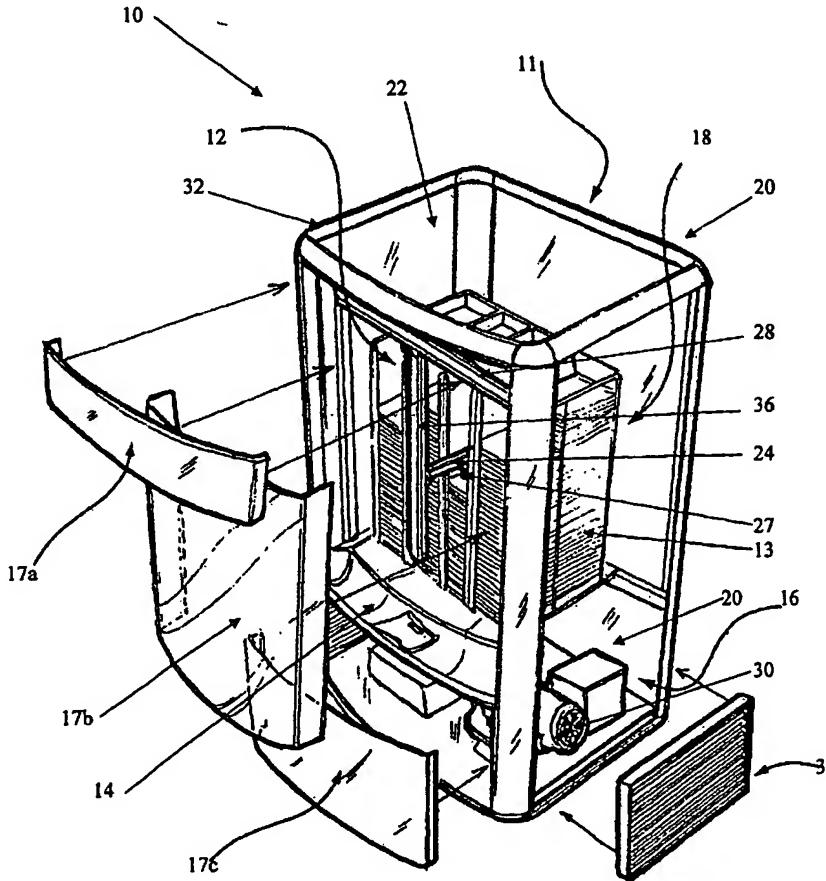
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(57) Abstract: Vending machine (10) houses two rows of four stacks of bags (13), differing in material or size. On coin actuation, bag (13) on the top of a selected stack is gripped by suction cup (27) and moved so that it falls into compartment (14), from where it is externally accessible. Suction cup (27) is movable, by a pneumatic ram, to-and-fro along horizontal arm (24) to grip, say, bag (13) of a rear stack and bring it forward so that it can be deposited in compartment (14). Arm (24), in turn, is movable up or down vertical arm (36) that, in turn, is movable horizontally along guide track (28) so that different stacks can be accessed.



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VENDING MACHINE FOR DISPENSING BAGSFIELD OF THE INVENTION
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The present invention relates to dispensing machines and in particular to vending machines for dispensing goods in response to a customer tendering payment for the goods.

BACKGROUND ART

At the moment, the majority of Australian retailers provide non-biodegradable plastic carry bags which end up as landfill or litter. Some of these bags are recycled at supermarket collection bins, but this is only a very small percentage of the total number of bags used.

Each year Australians throw away six billion plastic bags. That's 12,000 bags a minute, most discarded after one use.

The plastic bags clog waterways and kill thousands of sea birds, sea mammals and fish each year. Turtles, dolphins and killer whales mistake them for jellyfish and die of intestinal blockage.

Bags contaminate kerbside recycling, can remain undegraded in the environment for up to 1000 years, and cause problems for landfill.

There has been debate on the use of plastic bags but little action. The major supermarket chains have adopted the policy of asking customers if they need a bag. They have designed calico bags, and tried box systems.

The momentum for change is building. Ireland's €15 cent (26 cents) plastic bag tax, introduced in March 2002, has cut the number of discarded bags by 95 per cent.

Federal Ministers in some countries have warned that if consumers do not cut down on plastic bags they will consider imposing a tax or levy on them.

Recent surveys have shown that about 70 per cent of consumers worry that plastic bags harm the environment.

There are alternatives. One is the biodegradable plastic bag, which has cobalt in it. The cobalt breaks down the plastic within one and three years. Another is corn starch bags that biodegrade in four to six weeks.

There are various systems available for dispensing goods purchased from vending machines.

One such system is provided for vending products such as beverage and other food products, preferably individually packaged, from a storage unit to a customer terminal at a remote location through a pneumatic tube conveyor to move the product from storage to a dispensing unit at the remote location in response to 5 product selection made by a customer at the remote location. For example, the system may sell food, beverages or vehicle care products to customers at a fuel dispensing station by charging to a fuel charge system having a credit card reader associated with a self-service fuel pump to process the fuel purchase charge. The product is preferably moved through the conveyor in a reusable carrier or in its own product packaging 10 container that serves as a carrier.

Another system uses an existing product vending machine as a storage and loading device for use in a pneumatic vending and delivery system along with an interface unit in place of the vending machine door. A product dispensing terminal is connected by the delivery tube of a pneumatic conveyor from the storage and loading 15 device, which has a loading mechanism configured to load a product dispensed by the dispensing mechanism into the delivery tube. The pneumatic conveyor includes a back pressure source operable to apply reverse pressure to a product in the delivery tube to gently slow a product approaching the product dispensing terminal through the tube. A gate is selectively moveable into and out of the path of a product proximate the 20 outlet end of the delivery tube to stop a product slowed by the back pressure source and to release the stopped product for delivery to a customer at the product dispensing terminal. The loading mechanism includes a moveable member connected at one end to a blower and having an open end configured to receive a product dispensed by the dispensing mechanism and to seal the inlet end of the delivery tube with the received 25 product positioned between the blower and the tube. The moveable member is preferably a bucket shaped element pivotally mounted to move between an open position for receiving a product dispensed by the dispensing mechanism and a closed position sealing the inlet to the delivery tube.

Bag and sack storage dispensers are also known. These generally have 30 a housing that is secured to a mounting surface, preferably on the interior of a kitchen cabinet door. The housing has an integral frame that supports sacks or bags or other planar items during storage. The frame depends from a vertical base that mounts directly to the mounting surface. A horizontal support panel extends outwardly from

the door and base. An auxiliary support panel may also extend outwardly from the door and the base. The auxiliary panel extends parallel to but beneath the primary support panel. Each panel has at least one elongated slot penetrating its surface, although there may be more. The slots preferably run parallel to one another and 5 perpendicularly intersect the base. An elongated leg protrudes outwardly from each slot toward the base. Each leg has a foot on one end that secures the leg to the panel. The foot comprises a follower that moves in the slot. The other leg end comprises a terminal, resilient end that is oriented toward the cabinet door or other base attachment surface. A biasing assembly ensures that each leg is normally biased 10 toward the cabinet door or other base attachment surface.

Simpler dispensers are known. One such dispenser is a dispenser having a top surface and a front surface with a cut-out extending between the front and top surfaces with slits extending from sides of said cut-out along the front surface. A stack of plastic bags or plastic sheet pick-up tissues are arranged in the dispenser 15 and are dispensed by grasping an uppermost one via the cut-out and pulling outward with the bags being pulled one at a time through the cut-out and slits.

There are also automatic bag systems for supermarket check-out counters. These machines generally have some form of heat sealer for operation in relation to plastic rolls which form a bag around items positioned within the machine.

20 All of the above dispensers generally dispense disposable plastic bags. As described above, these bags cause or contribute to an environmental problem. None of the above dispensers are adapted to dispense bags which may be reusable.

SUMMARY OF THE INVENTION

The present invention is directed to a vending machine for dispensing 25 bags, which may at least partially overcome the abovementioned disadvantages or provide the consumer with a useful or commercial choice.

In a broad form, the invention resides in a vending machine for dispensing bags comprising a housing having an interior and an exterior, a storage compartment for storing bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, suction means positioned to allow movement between the storage compartment and the dispensing compartment, the suction means adapted to grasp the bags stored in the storage compartment, hold 30 the bags during movement and release the bags into the dispenser compartment, and

control means to control the movement of the suction means.

It is particularly preferred that the dispenser according to the present invention dispenses paper or other types of reusable bags. The invention according to the broadest form however, may be used to dispense other types of bags such as 5 woven high density polyethylene bags for example. Other types of bags may be dispensed in the alternative or in addition to the types described above such as bags made from calico or other types of cloth, or bags containing biodegradable material.

In one form, the invention resides in a vending machine for dispensing paper bags comprising a housing having an interior and an exterior, a storage 10 compartment for storing paper bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, suction means positioned to allow movement between the storage compartment and the dispensing compartment, the suction means adapted to grasp the paper bags stored in the storage compartment, hold the paper bags during movement and release the paper bags into the dispenser 15 compartment, and control means to control the movement of the suction means.

In another form, the invention resides in a paper bag vending machine for dispensing paper bags comprising a housing having an interior and an exterior, a storage compartment for storing bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, means for 20 moving the bags positioned to allow movement between the storage compartment and the dispensing compartment, the moving means adapted to grasp the bags stored in the storage compartment, hold the bags during movement and release the bags into the dispenser compartment, and control means to control the movement of the movement means.

25 In use, the vending machine may be located in a supermarket and users may approach the machine to insert money. This will activate the suction means which will then move to dispense the number of bags that the user has paid for. The tendering of money or payment by the user may activate a dispensing cycle. The machine is particularly directed towards the dispensing of bags as they are more rigid 30 than low density polyethylene plastic bags which are likely to be deformed and perhaps even destroyed by the suction means. Plastic bags may also cause the suction means to clog.

The housing may preferably be rectangular in configuration, having a

front wall, two opposed sidewalls, a rear wall, a base and a top wall. At least part of the front wall may suitably be see-through.

The housing may be divided internally into an upper and a lower portion. Preferably the upper portion may house the storage compartment and the necessary equipment while the lower portion may house the motor, or power producing equipment. This may assist with the appearance of the machine, particularly if the front wall of the machine is see through. The front wall may comprise more than one panel. There may be at least one panel for each of the upper and lower portions.

According to a particularly preferred embodiment, the front wall may comprise three panels, an upper front wall panel, a middle front wall panel and a lower front wall panel. The middle front wall panel may preferably be or comprise an access door to access the interior of the upper portion of the machine. The lower front wall panel may preferably be or comprise an access door to access the interior of the lower portion of the machine.

The housing may typically be manufactured from a lightweight but strong material such as metal except obviously the see-through portions. These may be made of engineering plastics to maintain strength but remain see-through. The housing may have a structural frame to which the walls are attached. The frame may provide substantially all of the strength and rigidity to the machine allowing it to remain light but strong.

At least one of the front, rear wall or side walls may suitably have an access panel or door to allow access to the interior of the machine. This may be necessary for service of the machine or for loading of the bags. The door may suitably be hinged and may occupy the whole or only part of the wall. The door may be securable against theft and so may be lockable. There may be more than one door.

Generally, for example, there may be a door or access panel to allow a user to access the dispensing compartment. This door is not necessarily positioned on the rear or side walls and most preferably is on the front wall of the housing. This door is preferably only openable during the dispensing cycle and is secured at all other times.

The housing may comprise one or more reinforced portion to reduce damage suffered by the housing and also to increase the security of the machine. As

an example, the corners of the housing may be reinforced to prevent damage to them, or the housing may be reinforced around any access panels to facilitate locking the housing.

The housing may suitably be on wheels or castors to allow the machine 5 to be moved more easily. The wheels may be securable to prevent the machine moving when movement is not desired. Securable wheels of this kind are well known and any type may be used.

The housing may also be equipped with lifting lugs to allow movement by cranes or forklifts, for example. It is envisaged that the machine may be rather 10 heavy and lifting lugs may be desired.

The storage compartment may suitably be rectangular or bin-like in shape with an open top into which the suction means may extend. There may be more than one storage compartment in each machine and in this case the storage compartments may contain different size bags.

15 The storage compartment may suitably be shaped to suit the shape of the bags to be stored and dispensed. It is envisaged that a number of different shape bags may be used in conjunction with the machine.

Part of the storage compartment may suitably be seen through so that 20 an indication of the inventory of bags disposed therein may be taken from outside the machine. The remainder of the storage compartment may generally be manufactured from a strong material such as metal.

The storage compartment may suitably not engage the bags closely. The walls of the compartment may be spaced a small distance from the periphery of the bags. The spacing may suitably not be so great that the bags are moved out of 25 alignment while being moved.

In a particularly preferred embodiment, the storage compartment may comprise a base, a front and an opposed rear wall and two opposed side walls. The base may have a movable base or a movable plate positioned above the base which can move up and down. The bags may suitably be placed on this moveable plate 30 during loading of the storage compartment. This moveable plate may move upward as the bags are used through provision of a spring or other type of resilient means. The movement of the plate may be controlled. The plate may be moved upward in small increments as bags are dispensed to allow a bag to always be in position for

engagement with the suction means until the storage compartment is empty.

The moveable plate may move the bags towards the suction means.

In another embodiment, the base may be fixed and the suction means may be movable within the storage compartment to the bags. The suction means may
5 be a suction cup or suction powered grippers or pincers.

The suction means may be associated with a movable arm assembly. The arm assembly may comprise an extendable arm member associated with the suction cup, a substantially vertical positioning arm and a guide means or track for the positioning arm. The extendible arm member may be adapted to extend over or into
10 the storage compartment. The extendible arm member may be fixed in length and the suction means may be extended due to the operation of a pneumatic ram. The suction means may then be able to move backwards and forwards along the length of the extendible arm member. The arm member may extend in a direction perpendicularly to the front wall of the machine and is preferably long enough that the suction cup can
15 extend to reach any of the bags in the storage compartment.

The arm member may also be associated with a substantially vertical positioning arm. The arm member may be able to move up and down on the positioning arm to follow the level of the bags in the storage compartment.

The positioning arm may be associated with a guide track to allow easy
20 movement across the width of the storage. The guide track may be equipped with stops at the extremities of movement to prevent movement outside these bounds. The guide track is preferably associated with an upper area of the upper portion of the machine. The positioning arm may suitably depend from the guide track.

The combination of the three components of the arm assembly may
25 allow the suction means to move along three axes of the storage compartment and to reach every bag disposed therein.

The suction means may be associated with a grip enhancing profile to assist in the gripping or movement of the bags.

The movable plate in the storage compartment may suitably be moved
30 utilizing compressed air or pneumatically. Other methods of movement are envisaged such as hydraulics. A pneumatic ram may suitably be used for the movement of the plate.

The storage compartment may be removable from the housing.

This may allow the storage compartment to be loaded with bags more easily and thereby facilitate refilling. The storage compartment may be on wheels which may be securable to prevent any undesirable movement of the storage compartment.

5 The bags with which the storage compartment is loaded may be disposed in a horizontal, flattened position. This position may allow the suction means to grasp and hold the bags more easily. Alternatively, the bags may be folded to provide a more stable unit for lifting or gripping. The bags may be associated together in packs of any number if so desired. The packs may be bound together using
10 any means but wrapping in cardboard or the like may be particularly preferred.

The dispensing compartment may suitably be positioned adjacent to the storage compartment within the housing. It may be positioned such that the bags disposed within the storage compartment cannot be reached through any access door in the housing. This may prevent theft of the bags.

15 The access door (if provided) to the dispensing compartment may only be opened as a part of the dispensing cycle. At all other times the access door may be secured with the last step in the dispensing cycle being the securing of the access door in the closed position. Preferably, the dispensing cycle may not start while the access door is opened. There may suitably be a "cutout" switch to prevent operation of the
20 machine while the door is opened.

The dispensing compartment may be shaped to allow the bags positioned therein to be readily accessible to a user upon opening the access door. In a particularly preferred embodiment, the dispensing compartment is located between the middle front wall portion and the lower front wall portion. The dispensing
25 compartment may have a curved base wall adapted to prevent any bags removed from the storage compartment from falling inside the housing and to ensure the availability of bags removed from the storage compartment fro the user.

The dispensing portion may be shaped to be accessible from the front of the machine but to prevent a user from reaching inside the machine to access the
30 bags disposed within. The dispensing compartment may have a curved wall disposed towards the base of the housing to allow any bags within the dispensing compartment to be directed downwardly and forwardly.

The suction means according to the invention may be any type of

means which utilises a suction method in order to grasp the bags. In particular, the suction may be applied directly to the bags in order to grasp and hold the bags, or alternatively, the suction may be applied to close fingers or other gripping means in order to grasp the bags. The suction means may preferably comprise a pneumatically operable suction cup. The suction cup may suitably be manufactured from a resilient material such as rubber.

As stated earlier, the engagement of the suction means with the bags may be through the bags being moved to the suction means or the suction means moved to the bags. The suction means may be moved to the bags utilizing an extendible arm member to reach into the storage compartment. The extendible arm member may be extended due to the operation of a pneumatic ram. The pneumatically operable suction cup may be located at the end of the extendible arm member.

The suction means may suitably be associated with a track or some other type of guide means to allow easy movement between the storage and the dispenser compartments. The track or guide means may be equipped with stops at the extremities of movement to prevent movement outside these bounds. The suction means may suitably be capable of stopping or pausing at multiple points along the track. Aspects of the position and movement of the suction means may suitably be controlled.

The control means may suitably be associated with a means for accepting payment for the bags. The control means may be separate from the means for accepting payment but in use the two may be connected to allow the control means to start the dispensing cycle once the payment has been made. Proximity switches, photoelectric cells may be associated with the control means to allow the correct positioning of the suction means with regard to the storage compartment and the dispensing compartment.

The means for accepting payment may be capable of accepting payment in any form including but not limited to credit cards, Electronic Funds Transfer (EFT), coins, notes or any combination of these. The means for accepting payment may suitably be capable of recognizing the denomination of payment and giving change if required. There may be a keypad or touch screen associated with the means in order to give a degree of control over the selection of the type and number of bags to be

dispensed.

The control means may allow the user of the machine to select the size of the bag required if the machine has more than one size bag contained therein.

5 The control means preferably controls all of the moving parts of the machine including the suction means, the moveable plate in the storage compartment (if applicable), the arm assembly associated with the suction means (if applicable), the means for accepting payment and giving change, opening of the access door to the dispensing compartment and the power source for the machine including the source of the air used in the pneumatics of the machine.

10 The control means may also control the movement and position of the suction means preferably through a feedback control loop.

15 The control means may suitably control the machine so that the tasks required to dispense a bag are performed in the desired format or order to accomplish the dispensing of the bag. The control means may suitably be a Programmable Logic Controller (PLC).

20 The control means may preferably include a MODEM in communication with a digital counting means. This feature may suitably allow monitoring of the level of inventory in the form of bags in each dispensing machine and/or machine performance, from a remote location. The remote location may be a central location adapted to monitor the number of bags in a number of machines spread over an area.

Each dispensing machine may preferably be equipped with an inventory level indicator.

25 The dispensing machine is preferably coin operated and includes control means which activates the suction means and any other internal workings of the dispensing machine in response to indication of receipt of the correct amount of money.

A pneumatic system is preferably utilised to control movement of bags from the storage compartment to the dispensing compartment.

30 The pneumatic system suitably includes a compressor which is activated responsive to sensing of receipt of payment of proper denomination and which may remain operable throughout each cycling of the machine.

The bags which may be used in the machine may be of any type

suitable for flat packing. The bags may be of any size or type of paper, for example small, medium or large bags, bags with integral handles, and wax-lined bags for damp and/or cold foodstuffs.

In another form the invention resides in a method for dispensing bags
5 from a dispensing machine comprising the steps of providing a plurality of bags in a storage compartment, accepting payment for the bags from a user, operating a suction means positioned to allow movement between the storage compartment and a dispensing compartment to grasp the bags stored in the storage compartment, the suction means holding the bags during movement and the suction means releasing the
10 bags into the dispenser compartment for collection by the user.

The step of accepting payment may occur at any stage in the process and the payment may even be performed remotely.

As stated above, there may be more than one type of bag available from a single machine. Suitably, a single dispensing machine may dispense a selection of bags of differing dimensions as well as a selection of bags manufactured from different materials. In particular, the storage compartment may have a plurality of compartments, each compartment storing a plurality of different sized bags and/or bags manufactured from different materials. These different sized and manufactured bags may offer the user a commercial choice in the type of bags purchased from the
15 vending machine. The control means may control the operation of the suction means in accordance with the user's selection of bags required by the user of the machine and provide that bag to the user.
20

According to an alternative embodiment, the storage compartment of the machine maybe in the form of a carousel which rotates. The carousel may store a plurality of bags or groups of bags therein or on. The carousel may suitably be an indexing carousel and the movement of the carousel may align the bags or groups of bags with the suction means. The suction means may then remove the bags or groups of bags from the carousel to the dispensing compartment. The carousel may have one or more levels disposed vertically above each other and the suction means may be adapted to remove a bag or group of bags from any location in any of the levels.
25 Preferably, the suction means may be located toward the front of the machine and the carousel may rotate to orient the bags or group of bags to be dispensed from the machine to the suction means. The suction means may then not be required to move
30

extended distances around the machine to reach the bags.

The carousel may be indexed and controlled using a particular means of indexing. In particular, rotary or linear actuators may be used to control the position and movement of the carousel.

5 The dispensing machine of the present invention may further preferably comprise an information screen located on the front or upper portion of the machine. The information screen may suitably be in the form of a playback device capable of playing prerecorded messages such as information messages about the damage caused by disposable plastic bags. Ideally, the information screen may be interactive. The
10 information screen may suitable be capable of displaying television signals or other signals.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will be described with reference to the following drawings, in which:

15 Figure 1 is a perspective view of a vending machine according to a preferred aspect of the present invention showing the internal workings.

Figure 2 is a top view of the vending machine of Figure 1.

Figure 3 is a front view of the vending machine of Figure 1.

Figure 4 is a side view of the vending machine of Figure 1.

20 Figure 5 is a perspective view from the rear of the vending machine of Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

According to an aspect of the invention, a vending machine 10 is provided.

25 The vending machine 10, as illustrated in Figure 1 comprises a generally rectangular housing 11 having an interior and an exterior. A storage compartment 12 for storing bags 13 is located in the interior of the housing, towards the center of the machine. There are a plurality of storage sub-compartments 23 each storing different sized bags or bags of differing materials. The storage compartment
30 12 is located above a dispensing compartment into which bags 13 removed from the storage compartment 12 are deposited in order to be available to the user which purchased them.

A dispensing compartment 14, accessible from the exterior of the

housing 11, is positioned adjacent the storage compartment 12. Suction means 15 is positioned with respect to the storage compartment 12. The suction means 15 allows movement between the storage compartment 12 and the dispensing compartment 14. The suction means 15 is adapted to undergo a dispensing cycle in which it grasps the bags 13 stored in the storage compartment 12, holds the bags 13 during movement from the storage compartment 12 to the dispensing compartment 14 and releases the bags 13 into the dispenser compartment 14. Control means 16 is provided to control the movement of the suction means 15.

The housing 11 is generally rectangular, having a front wall 17, two opposed sidewalls 18, 19, a rear wall 20, a base 21 and a top wall 22. At least part of the front wall 17 is see-through to allow a user to watch the workings of the machine 10. The front wall as illustrated in the Figures comprises more than one portion, an upper front wall portion 17a, a middle front wall portion 17b and a lower front wall portion 17c. The upper front wall portion 17a is associated with signage identifying the bags available and perhaps the company selling the bags. As illustrated in Figure 1, the machine has a skeletal structural frame 32 to which the walls are attached and secured. This allows the walls to be quite light while the structural frame 32 provides the necessary strength and rigidity.

The front wall 17 has an access panel. Generally the entire middle front wall portion 17b is an access panel to allow access to the interior of the machine 10 to allow for loading of the bags 13. The access panel 17b is hinged and occupies the whole of the middle front wall portion 17b. The access panel 17b is securable against theft and is lockable.

A further access panel 17c can be provided adjacent a lower portion of the machine to allow access to the lower portion of the machine. The workings of the machine including any motor, compressor 30 or vacuum pump is located in a lower portion of the machine. Also included in the lower portion of the machine is the storage of money and/or change to be provided. The lower portion may also be equipped with side ventilation areas 33 to allow cooling of the motor for the machine. These side ventilation areas 33 are removable to allow extra access to the lower portion.

The housing 11 is on wheels (not shown) to allow the machine 10 to be moved more easily. The wheels are securable to prevent the machine moving when

movement is not desired.

The storage compartment 12 is generally rectangular with an open top into which the suction means 15 extends. There is more than one storage compartment 12 in the machine shown in Figure 1 and in this case the storage compartments 12 may contain different size bags 13 or bags manufactured from different materials. The storage compartment comprises four sub-compartments 23 wide by 2 deep.

The storage compartment 12 has a base, a front and an opposed rear wall and two opposed side walls. It also includes a plurality of internal dividing walls 10 to divide it into sub-compartments 23.

In the embodiment illustrated in Figure 1, the base of the storage compartment is fixed and the suction means 15 is movable within the storage compartment 12 to the bags 13.

The storage compartment 12 is removable from the housing 11. This 15 allows the storage compartment 12 to be loaded with bags 13 more easily. The access door 17b is secured in the closed position. The dispensing cycle may not start while the access door 17b is opened.

The bags 13 with which the storage compartment 12 are loaded are disposed in a horizontal, flattened position. This position allows the suction means 15 20 to grasp and hold the bags 13 more easily.

The dispensing compartment 14 is positioned adjacent the storage compartment 12 within the housing 11.

The dispensing compartment 14 is accessible by the user regardless of the portion of the dispensing cycle.

The dispensing compartment 14 is shaped to allow access by a user. It 25 is located between the middle front wall portion 17b and the lower front wall portion 17c. The dispensing compartment has a curved base wall adapted to prevent any bags removed from the storage compartment 12 from falling inside the housing 11 and to ensure the availability of bags removed from the storage compartment for the user.

The dispensing portion 14 is shaped to be accessible from the front of 30 the machine but to prevent a user from reaching inside the machine to access the bags disposed within. The dispensing compartment 14 has a curved wall disposed towards the base of the housing 11 to allow any bags 13 within the dispensing compartment 14

to be directed downwardly and forwardly.

The suction means 15 is a pneumatically operable suction cup 27. The suction cup 27 is manufactured from rubber.

The suction cup 27 is moved to the bags utilizing a movable arm assembly. The arm assembly comprises an extendable arm member 24 associated with the suction cup 27, a substantially vertical positioning arm 36 and a guide means or track 28 for the positioning arm 36. The extendible arm member 24 is adapted to extend over or into the storage compartment 12. The extendible arm member 24 is fixed in length and the suction cup 27 is extended due to the operation of a pneumatic ram. The pneumatically operable suction cup 27 is able to move backwards and forwards along the length of the extendible arm member 24. The arm member 24 extends in a direction perpendicularly to the front wall of the machine and is long enough that the suction cup 27 can extend to reach any of the bags in the storage compartment 12.

15 The arm member 24 is associated with a substantially vertical positioning arm 36. The arm member 24 is able to move up and down on the positioning arm 36 to follow the level of the bags in the storage compartment 12.

20 The positioning arm 36 is associated with a guide track 28 to allow easy movement across the width of the storage compartment 12. The guide track 28 is equipped with stops at the extremities of movement to prevent movement outside these bounds.

The combination of the three components of the arm assembly allow the suction cup 27 to move along three axes of the storage compartment 12 and to reach every bag disposed therein.

25 The control means 16 is associated with a means for accepting payment 29 for the bags 13. The control means 16 is connected to the means for accepting payment 29 to allow the control means 16 to start the dispensing cycle once the payment has been made.

30 The pneumatic system operating the suction cup 27 and the arm assembly includes a compressor 30 which is activated responsive to sensing of receipt of payment of proper denomination and which may remain operable throughout each cycling of the machine.

In the present specification and claims, the word "comprising" and its

derivatives including "comprises" and "comprise" include each of the stated integers but does not exclude the inclusion of one or more further integers.

CLAIMS:

1. A vending machine for dispensing bags comprising a housing having an interior and an exterior, a storage compartment for storing bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, suction means positioned to allow movement between the storage compartment and the dispensing compartment, the suction means adapted to grasp the bags stored in the storage compartment, hold the bags during movement and release the bags into the dispenser compartment, and control means to control the movement of the suction means.
- 10 2. The vending machine as defined in claim 1, wherein the vending machine further comprises a means for accepting payment for the bags prior to dispensing the bags, the payment initiating a dispensing cycle once made.
- 15 3. The vending machine as defined in claim 1, wherein the machine dispenses at least one type of bags chosen from the group comprising paper bags, woven high density polyethylene bags, calico bags, cloth bags, and bags containing biodegradable material.
- 20 4. A vending machine for dispensing paper bags comprising a housing having an interior and an exterior, a storage compartment for storing paper bags located in the interior of the housing, a dispensing compartment accessible from the exterior of the housing, suction means positioned to allow movement between the storage compartment and the dispensing compartment, the suction means adapted to grasp the paper bags stored in the storage compartment, hold the paper bags during movement and release the paper bags into the dispenser compartment, and control means to control the movement of the suction means.
- 25 5. The vending machine according to claim 1 wherein the storage compartment comprises a base, a front wall and an opposed rear wall and two opposed side walls, the base associated with a movable plate positioned above the base which can move up and down.
- 30 6. The vending machine according to claim 5 wherein the movable plate is located adjacent the base when the storage compartment is filled and moves upwardly in small increments as bags are dispensed to allow a bag to always be in position for engagement with the suction means until the storage compartment is empty.
7. The vending machine according to claim 1 wherein the storage compartment

comprises more than one storage area each storage area containing different size bags.

8. The vending machine according to claim 1 wherein the bags with which the storage compartment is loaded are disposed in a horizontal, flattened position.

9. The vending machine according to claim 1 wherein an access door is provided to 5 the dispensing compartment, and the access door is only opened as a part of a dispensing cycle and the dispensing cycle does not operate while the access door is opened.

10. The vending machine according to claim 1 wherein the suction means is associated with a guide means to allow easy movement between the storage and the 10 dispenser compartments.

11. The vending machine according to claim 1 wherein the control means is associated with a means for accepting payment for the bags to allow the control means to start the dispensing cycle once the payment has been made.

12. The vending machine according to claim 1 wherein the control means include 15 a communication means with a digital counting means allowing monitoring of the level of inventory of bags in a vending machine from a remote location.

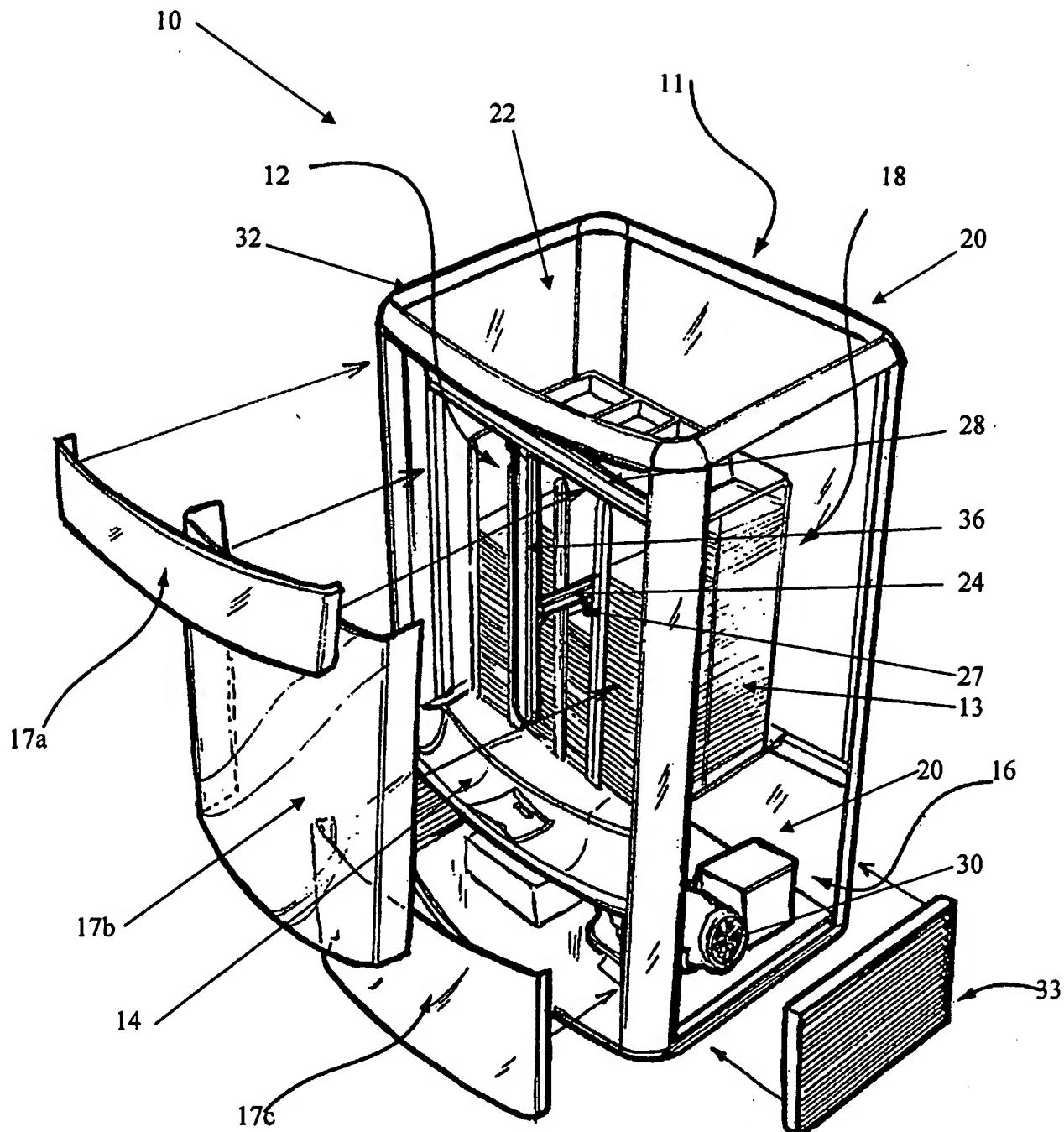
13. A method for dispensing bags from a vending machine comprising the steps of providing a plurality of bags in a storage compartment, accepting payment for the bags from a user, operating a suction means positioned to allow movement between the 20 storage compartment and a dispensing compartment to grasp the bags stored in the storage compartment, the suction means holding the bags during movement and the suction means releasing the bags into the dispensing compartment for collection by the user.

14. The vending machine according to claim 1 further comprising an information 25 screen located on a front portion of the machine capable of playing prerecorded messages such as information messages about the damage caused by disposable plastic bags.

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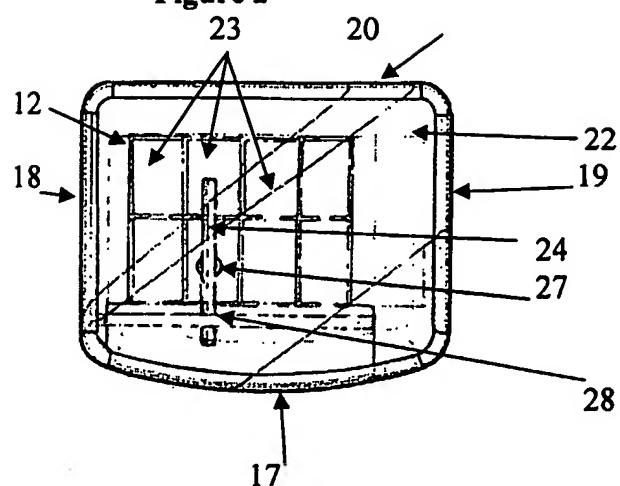
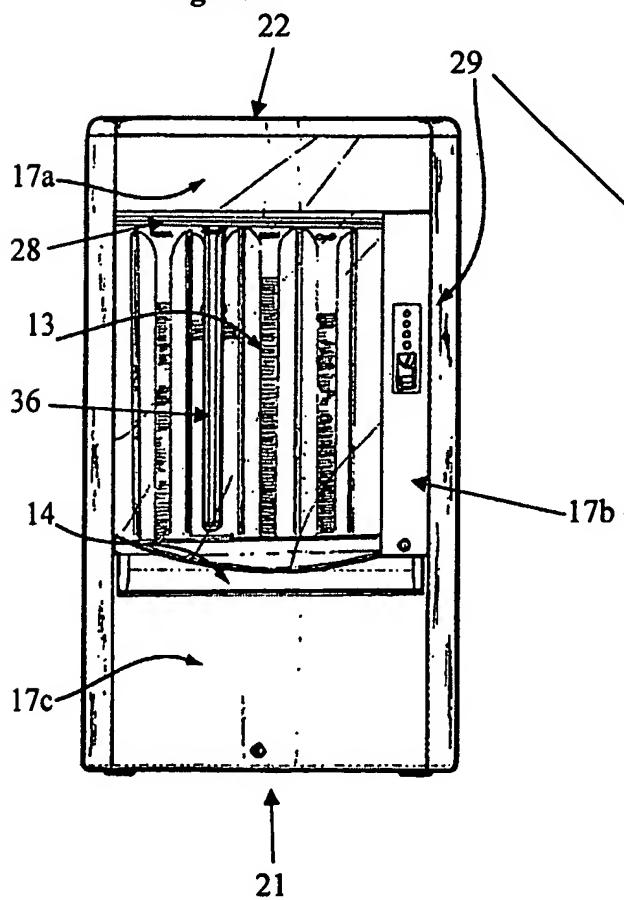
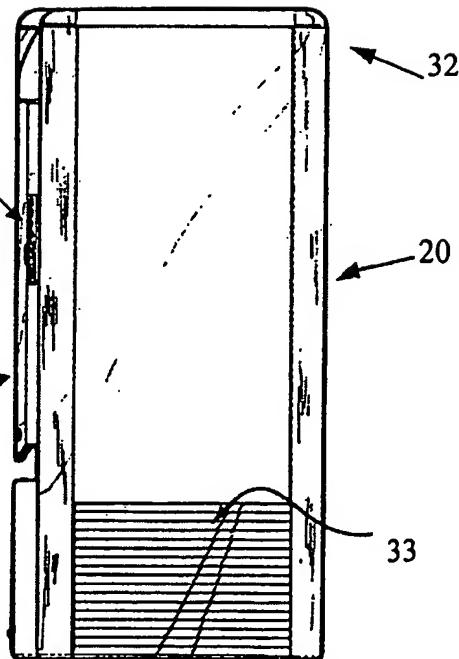
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Figure 1



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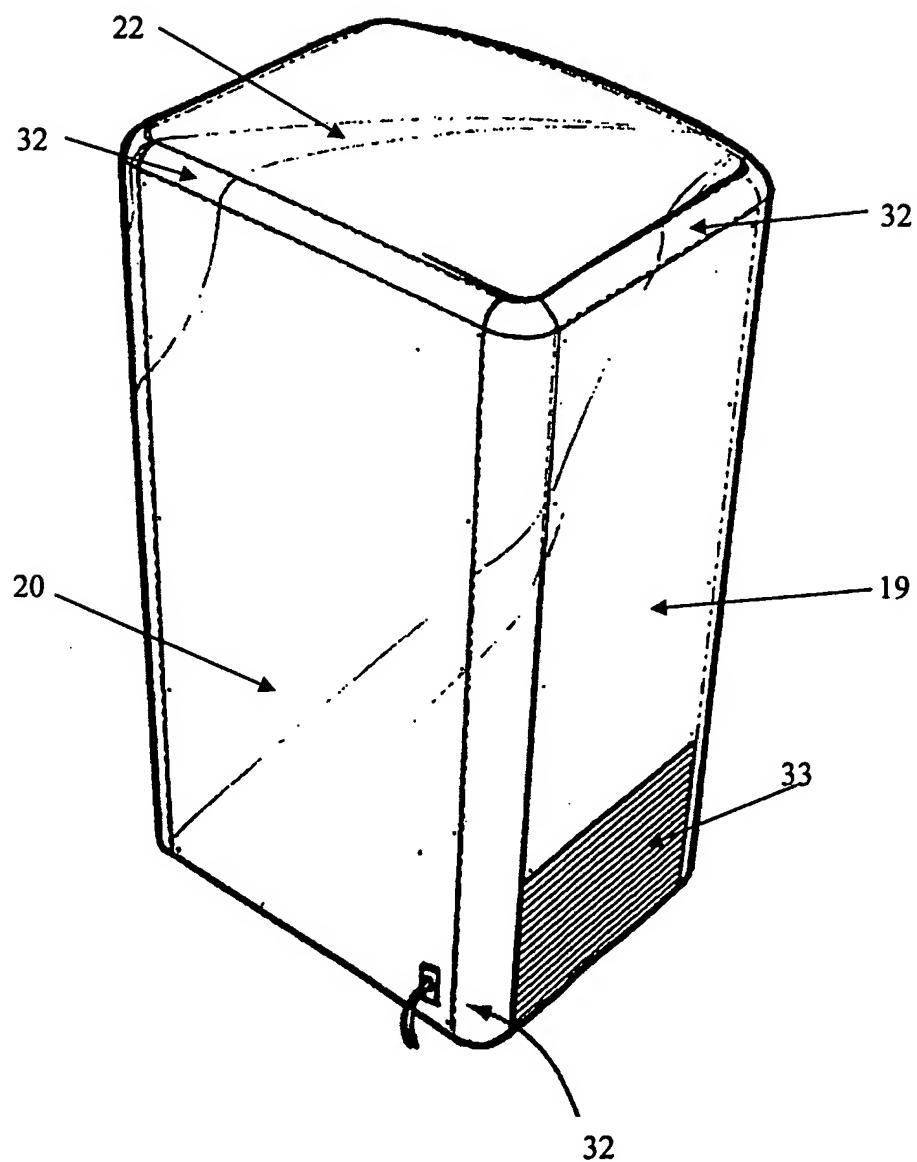
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Figure 2**Figure 3****Figure 4**

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Figure 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/01348

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : G07F 11/16, B65H 5/10		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) Refer to electronic data bases consulted below.		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Derwent World Patent Index and esp@ce and USPTO Internet sites: IPC G07F 11/-, B65H 5/00-5/10 and keywords: suction, vacuum, vend, merchandise, dispense, coin, token, money and similar terms		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 193797 B (ALCATEL SATMAM) 21 March 1990 See whole document.	1-14 5-6
Y	EP 1178448 A (STAAR SA) 6 February 2002 See whole document.	1-14 5-6
X	EP 8119 A (LEHMANN) 20 February 1980 See whole document.	1-14 5-6
Y		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 28 November 2003		Date of mailing of the international search report 3 - DEC 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer I.A. KILBEY Telephone No : (02) 6283 2115

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/01348

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/96142 A (CHIRNOMAS) 20 December 2001 See whole document.	1-14 5-6
X	FR 2273329 A (VAUDEZ) 26 December 1975 See whole document,	1-14
Y	This document discloses a "movable plate" as per claims 5-6 (see, in particular the figures and lines 6-28 of page 7) and can be combined with the disclosures of the other documents above in this respect.	5-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU03/01348

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member
EP 193797	FR 2577912
EP 1178448	BE 1013576
WO 01/96142	CA 2409563
	EP 1289865

END OF ANNEX